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The Geography and Agriculture of the Middle East

Naomi F. Miller and Katherine M. Moore

Opposite
This clay tablet from Nippur (B13885) dates to about 1500 BCE. It illustrates a canal system that may have been used for both irrigation and transportation.

Map Key

Lowlands | Piedmont | Mountains | Iranian Plateau

Introduction

The core of the Middle East, the modern term for a region known in ancient and medieval contexts as the Near East, encompasses present-day Iraq, Iran, Syria, and southeastern Turkey. Most of this region experiences a Mediterranean-influenced climate, with cool or cold, wet winters and hot, dry summers. This climate pattern, despite some fluctuation, was established by the end of the Ice Age (10,000 BCE).

In this chapter, the geography and agricultural potential of this region are discussed. The region is divided into four major zones distinguished by long-standing natural and cultural features: (1) a mountainous arc formed by the Taurus and Zagros Mountains; (2) a rolling piedmont zone; (3) the flat lowlands of Mesopotamia; and (4) the Iranian Plateau, which supports both harsh desert and fertile uplands. The maps (Figs. 2.1, 2.2, 2.3) included in this chapter show the relationship between topography, precipitation, and vegetation.

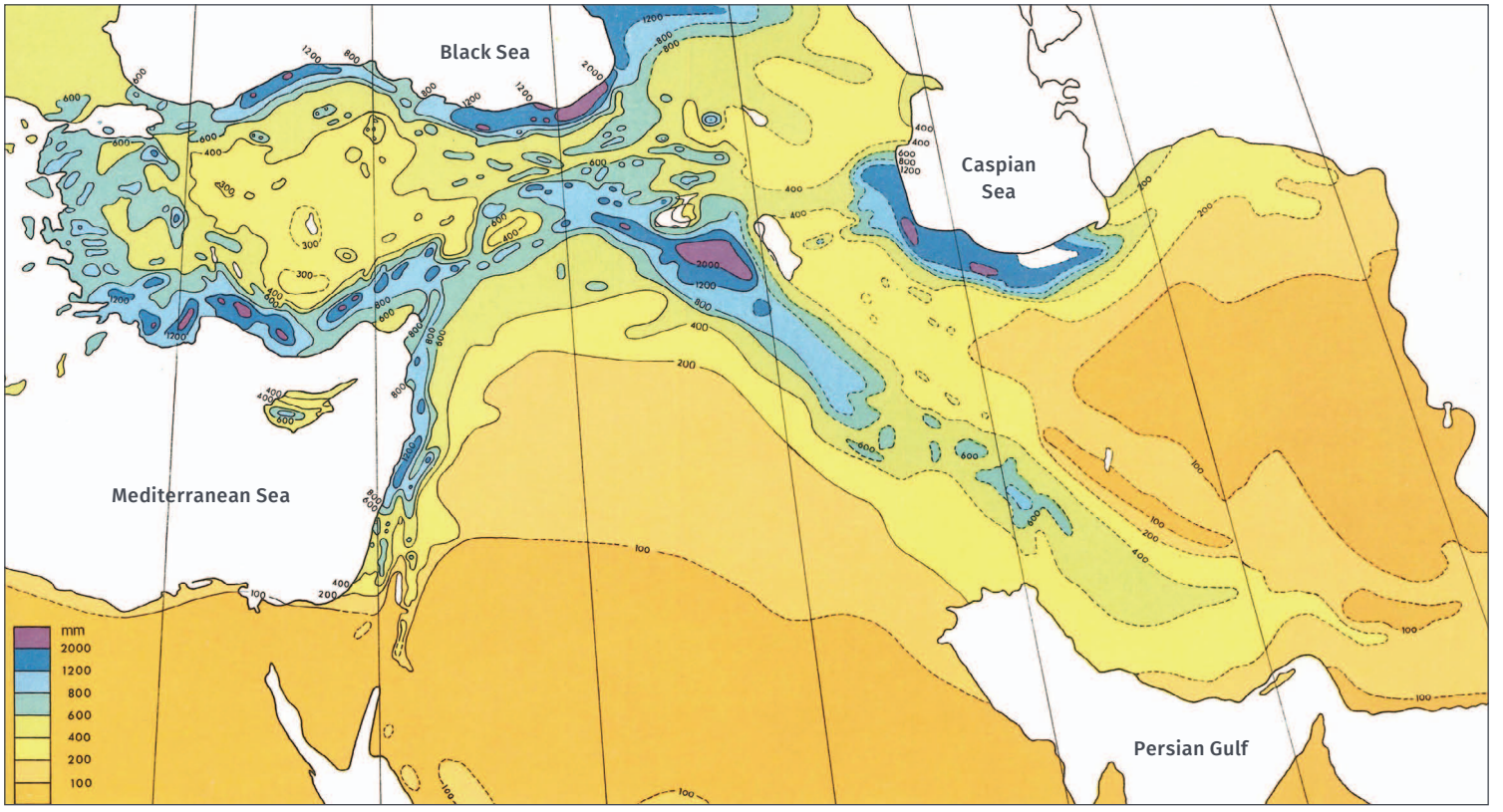
The people of the ancient Near East adapted their lifestyle to existing environmental conditions, but they also changed the landscape in which they lived. By about 10,000 BCE, even before they began to cultivate plants and keep herds, communities in parts of the Near East began to live year-round or nearly year-round in small settlements. These small sedentary communities developed ways of preserving and storing foods from wild plants and animals. While excavating such settlements, archaeologists have found storage pits dug into the ground as well as traces of round stone structures, some residential and some ritual.

There is ongoing debate about the degree to which any period of drought or climate amelioration affected cultural trends and historical events, but agriculture began in about 8000 BCE under conditions favorable for plant cultivation and animal husbandry and became established by about 6000 BCE. Pottery containers made of fired clay first appeared around 7000 BCE and came into common use by about 6000 BCE. Populations grew as agriculture and related technologies became widespread, and human activity played an increasing role in shaping the land. Over millennia, fuel-intensive technologies such as pottery production and metallurgy had an even larger impact on both the vegetation and the land.

Innovations in Agriculture and Animal Husbandry

The area comprising the lowlands of Iraq and the surrounding piedmont of the Taurus-Zagros arc is known as the Fertile Crescent. The piedmont zone, with a natural vegetation cover of grassland and open woodland, saw the earliest experiments in plant cultivation and animal herding (Fig. 2.4). Favored with precipitation exceeding 250 millimeters (10 inches) per year, it is possible to farm here without supplemental irrigation.

Fig. 2.1 ***Opposite***
Topographic map showing the four main geographical zones discussed in this chapter: the lowlands, piedmont, mountains, and Iranian Plateau.



The first farmers began to cultivate locally available plants: wild cereals, like einkorn wheat, emmer wheat, and barley; wild legumes, like lentil, chickpea, pea, and bitter vetch; and wild flax, grown initially for fiber. The ancestors of the earliest domesticated food animals—sheep, goat, cattle, and pig—are native to this part of the world, too. Additionally, dogs had long accompanied the hunting and foraging peoples of the ancient Near East as companions and work animals.

These wild ancestors of the earliest domesticated plants and animals thrived over much of the Near East, especially in the piedmont zone. But not all species occurred in any one place, and it took about a thousand years for the different pieces of the Middle Eastern farming system to come together. Once established in the piedmont zone, agriculture spread to the lowlands of the Tigris and Euphrates River Valleys, the region archaeologists call Mesopotamia.

The first settlers in southern Mesopotamia (ca. 6000 BCE) encountered marshland inhabited by fish and migratory birds at the head of the Persian Gulf, as well as lowland steppe with rich winter pasture located away from the sea (Figs. 2.5, 2.6).

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Fig. 2.2 ***Above***
Precipitation map. Rainfall is strongly influenced by elevation. After Zohary 1973: map 5.

Fig. 2.3 ***Opposite***
Vegetation map of the Middle East. Forests and woodlands grow in moister regions. The Iranian and Anatolian Plateaus, which lie in the rain shadows of the coastal and Zagros Mountains, are mostly arid. Adapted by N. F. Miller and M. A. Pouls from Zohary 1973: map 7. Redrawn by Ardeth Anderson.

Map Key

- Caspian and Black Sea temperate forest
- Mediterranean steppe-forest
- Mediterranean coastal woodland
- Indo-Turanian steppe and desert
- Kurdo-Zagrosian oak and pistachio-almond steppe-forest
- Syrian steppe
- Arabian desert
- Sub-tropical desert and savanna

How Old Is It?

Naomi F. Miller, with contributions from Renata Holod

There are many ways of determining the relative and absolute dates of archaeological sites, deposits, and objects. The techniques described here yield dates of varying degrees of precision.

The Three-Age System

The division of early human history into the Stone, Bronze, and Iron Ages, was proposed in the 19th century by Danish archaeologist Christian Thomsen as a way of organizing European archaeological artifacts for museum display. In excavated deposits, iron tools were found closer to the surface than bronze tools, which were in turn found above stone tools. By inference, the Stone Age was the oldest, followed by the Bronze Age, and the Iron Age was the most recent. Archaeologists no longer use these terms as strict chronological markers. Rather, the Stone, Bronze, and Iron Ages are used as a shorthand to refer to periods roughly defined by a group of related subsistence practices, technologies, and organizational traits, especially as the timing of transition between them varies regionally. For the ancient Near East, the Stone Age is generally associated with societies dependent on wild foods and the first farming societies; the Bronze Age is associated with early literate civilizations and the first expansive political entities of the 3rd and 2nd millennia BCE; and the Iron Age is associated with the later literate civilizations and empires of the 1st millennium BCE.

Relative Dating

Relative dating can determine whether one deposit or object is earlier than another, but by itself does not give a calendar date.

Stratigraphy

Many Middle Eastern archaeological sites are mounds, which were created as people built, tore down, and rebuilt houses, walls, and other structures over hundreds or thousands of years. Later structures that were built over the remains of earlier ones and areas strewn with garbage produce layers of soil and debris, which are called ‘strata’ by archaeologists. Archaeologists excavate from top (the ground surface and most recent layers) to bottom (the oldest layers and the first to be laid down). Sometimes, pits or graves are cut into older cultural layers. Such features may, therefore, lie below or intrude into the absolute elevation of an earlier surface (Figure 2S1.1). Archaeologists are trained to “read” the layering of the deposits. Mounds are such an important feature of the landscape of the Middle East that the site names in many languages include the word for mound, like the “tel” in Tel Aviv.

Style

Much as we can assign approximate dates to photographs based on clothing styles, archaeologists can trace changes that occur over time in such features as ceramic decoration and even brick size. Combining the analysis of stratigraphy and style creates a powerful tool for correlating dates between sites and regions: the stratigraphic position of an object indicates its age in relation to other objects, and the relative age of different sites (as indicated by the age of the objects found at each) can then also be compared.

Absolute Dating

Absolute dating gives a specific calendar date or date range for an item found in a deposit; archaeologists can infer the date of the deposit from the object within it that bears the most recent date.

Radiocarbon Dating

Charred seeds and wood, which are evidence for ancient vegetation, land use, and food, can be submitted for radiocarbon dating. Dates obtained from organic materials have varying degrees of precision (e.g., 1423 BCE ± 100 years).

Written Records

Long before paper, dated economic transactions and lists of dynasties were impressed on clay tablets in cuneiform writing. Exploits of kings were carved on stone monuments, stone buildings (where stone was available in sufficient quantity for use in construction), and rock cliffs. By themselves, these kinds of records do not provide an absolute chronology, but cross-referencing groups of related records and correlating them with the results of other dating techniques can generate fairly precise chronologies.

Coins

Though not indestructible, coins (especially gold and silver ones) may last a long time in the soil. Dates of coin minting took three forms: a regnal date of a ruler; the date written in Arabic script, a practice that began in the 8th century CE; or a numerical date, which began to appear in the 14th century CE. Even in the absence of a legible date, style and subject matter may also provide a (relative) date range for coins (see Chapter 7S5: Currency).

Clay and Metal Vessels

Sometimes artisans painted, carved, impressed, or incised the date of manufacture onto pottery or metal vessels. In cases where archaeologists understand a historical dating system, it can be translated into our own dating system. We can easily correlate dates from the Jewish, Zoroastrian, Christian, and Islamic calendars; nowadays we use BCE and CE, standing for "Before the Common Era" and "Common Era," rather than BC and AD.

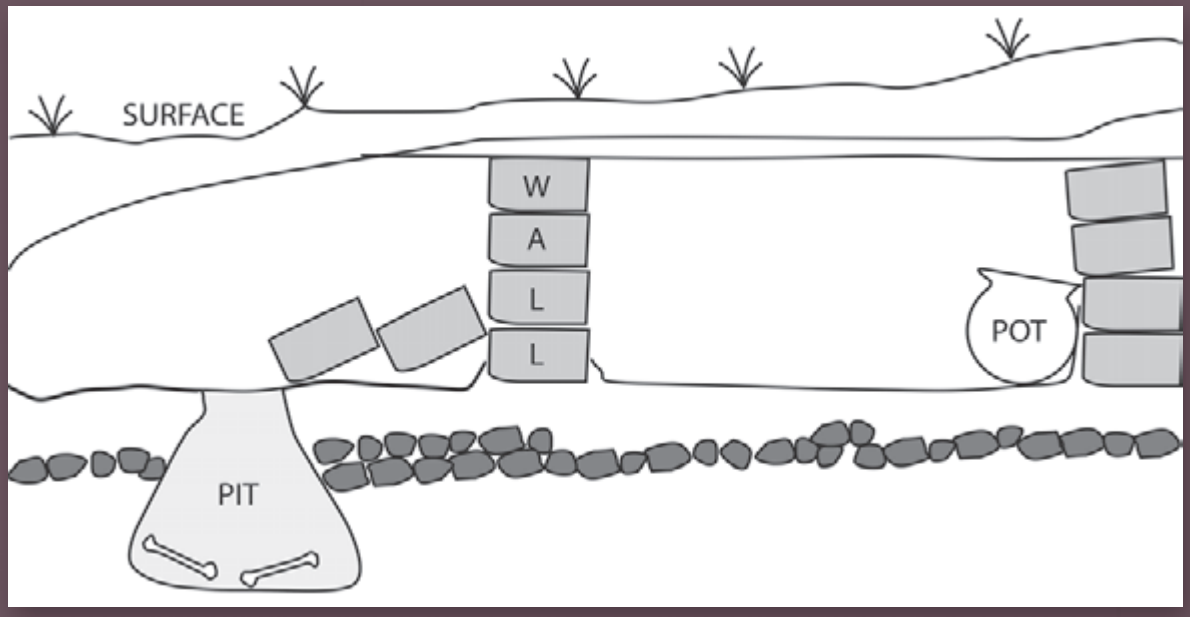

Fig. 2S1.1 ***Left***
Schematic cross-section of an excavated building showing two walls and fallen bricks, a later trash pit dug into a floor, and an earlier stone pavement. A clay pot leans against a mudbrick wall. The modern ground surface is indicated with plants.

Wood was scarce, as the only trees grew along the rivers, and stone was almost entirely absent. Thus, the marsh dwellers lived in houses made of reed bundles, while the inhabitants of the drylands (or steppe) built structures of sun-dried mudbrick. Annual rainfall was and still is insufficient for dry farming in this zone, so fields have always been irrigated here. Initially important for irrigation, the Tigris and Euphrates Rivers and their tributaries became important routes of trade, communication, and transport of goods. The climate in this region is warm enough for the date palm, which was domesticated by 4000 BCE.

By 6000 BCE at the latest, agricultural practices spread to the Iranian Plateau (Figs. 2.7, 2.8). This region is characterized by virtually uninhabitable central deserts surrounded by moister uplands that support rain-fed farming or irrigation agriculture. In the 1st millennium BCE, this region saw the development of *qanats*, a kind of irrigation that brings groundwater from higher elevations to fields by means of underground built channels (see Chapter 11S3: Irrigation and the *Qanat*). This region is rich in stone and metal and situated on trade routes between the Mesopotamian lowlands and destinations to the east.

Fig. 2.4 ***Above***
Flocks in piedmont steppe. Nowadays, this region is farmed and heavily grazed. In antiquity, this region would have had trees scattered among the pasture and farmland.

The fourth region, the Zagros Mountains, separates the piedmont and Mesopotamia from the upland plateau. The mountain slopes support open woodland of oak in the moister north and pistachio and almond trees to the south (Fig. 2.9). The flat valleys are suitable for dry farming (Fig. 2.10). Some of the peoples of the Zagros Mountains became primarily dependent on herding and moved annually to take advantage of winter pasture in the warm lowlands and summer pasture in the cooler highlands.

Why Farm and Domesticate Animals?

Archaeologists have long grappled with the question of why people began to cultivate plants and herd animals. After all, some ancient Near Easterners had been living successfully in small communities year-round for about a thousand years, subsisting on wild resources. Several factors likely contributed to the shift towards agriculture and animal husbandry. Some plants, like acorn-yielding oak, are very productive but have unpredictable yields from one year to the next even as others, like the wild wheats, can grow as densely in the wild as in a cultivated field and be stored for use over the course of a year. Animals, unlike plants, move around and may become locally scarce due to overhunting or habitat destruction.

Over the long term, it seems that local changes in the plant cover and animals living near settlements combined with ameliorating climate conditions encouraged people to stabilize their food supply by adding cultivation and animal husbandry to their subsistence strategy. Eaten together, cereals and large-seeded legumes (pulses) would have provided energy and protein for the diet; the addition of animals would have provided a ready source of fat, as well as protein; and animal dung would also have helped maintain soil fertility in the fields. Investments in land and animals would have further tied people to one location. For people who were already committed to a settled way of life, and who did not have the option of simply going to the grocery store when times were tough, plant and animal husbandry would have provided a stable food supply. As populations increased, it was no longer possible for them to revert to a hunting and gathering way of life.

Domesticated Plants and Animals

By 6000 BCE, people in much of the ancient Near East had already begun to live year-round in settlements constructed of stone and mudbrick. Their livelihood was based on plant and animal husbandry. Those first cultivated plants and herded animals were the direct descendants of their wild counterparts. As the lives of people, crops, and animals became intertwined, genetic changes created new "domesticated" species.

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Did The Land Always Look Like This?

Naomi F. Miller

Vegetation is largely determined by climate and soil substrate combined with and influenced by other natural and physical factors. Millennia of farming, industry, and urbanization created the landscape of the modern Middle East. Deforestation and the destruction of plant cover by agricultural and urban development make it difficult to know what, in principle, might grow in a place. Therefore, ancient vegetation patterns must be inferred from relict vegetation (that is, plants surviving in out-of-the way pockets) and the reports of plant explorers and botanical researchers, who have been documenting the vegetation for several hundred years.

There are many ways that botanists and archaeologists can trace changes in plant cover over time. Palynologists, who identify and analyze pollen, drill cores through soil layers that have accumulated undisturbed on lake bottoms to extract pollen that blew in from plants growing in the surrounding region. Complementary information can be gleaned from charred seeds and wood excavated from archaeological sites. Unlike pollen grains, which are not visible to the naked eye, these macroremains come from material brought to settlements as food, fodder, fuel, or building material. Climate scientists, too, have developed methods for measuring climate change over time. For example, oxygen isotopes in the Greenland ice cores have been used to trace global temperature changes over several hundred thousand years. Since vegetation is potentially affected by both climate and human activity, it is not

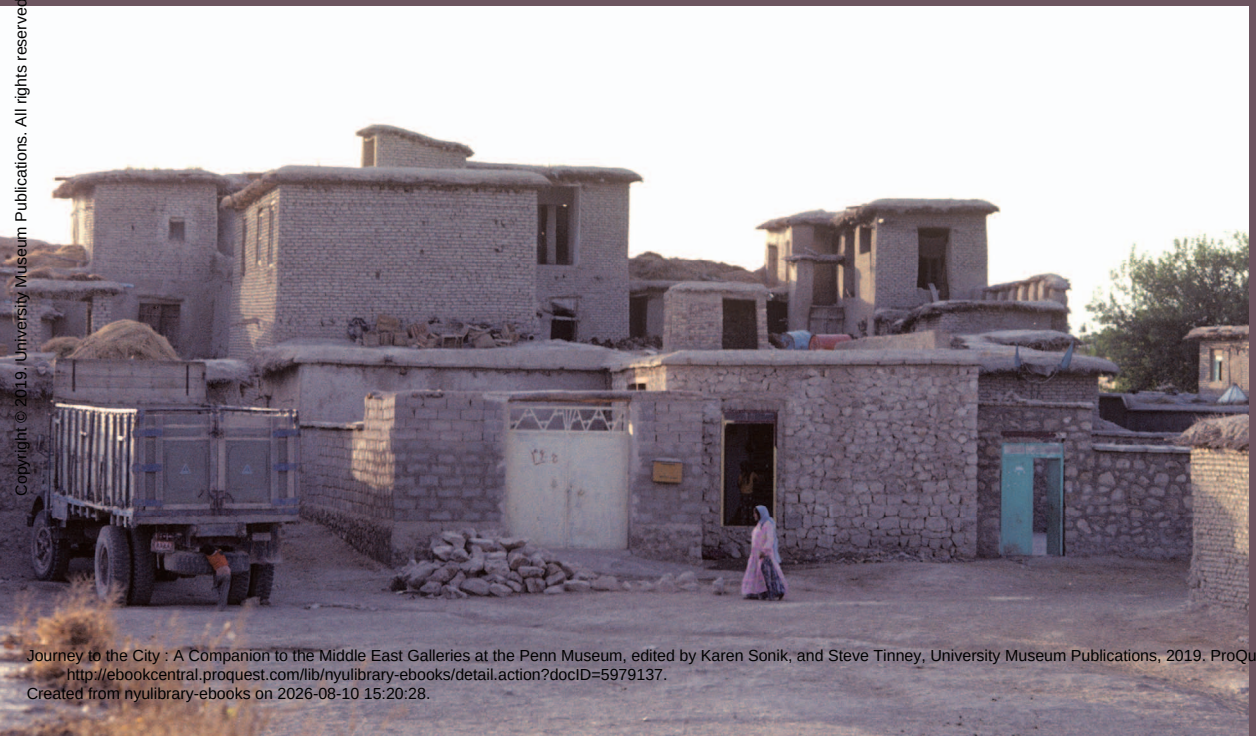

Fig. 2S2.1 ***Left***
It is not only the landscape that changes over time. The built environment does, too. Modern satellite images of this Iranian village show that the mudbrick and stone buildings seen in the 1978 photograph have disintegrated over time, just as similar structures did in the ancient past. Some of the forces at work are hinted at by the sugar beet truck and yellow post office box, which connected the village to the wider world.

always clear what caused specific changes in plant cover in particular places. The combined results of these analyses, however, demonstrate widespread human influence on the landscape from the 1st millennium BCE. Localized vegetation changes can also sometimes be traced in earlier periods.

Fig. 2S2.2 ***Above***
This village, built at the base of an archaeological mound near the Euphrates River, was made of mudbrick. It is now under the waters behind the Atatürk Dam in southeastern Turkey.

Fig. 2.5 ***Opposite***
The first cities of Mesopotamia were situated in the marshlands of southern Iraq.

Fig. 2.6 ***Right***
A palm grove in southern Mesopotamia with a traditional mudhif house made of reed bundles.

The First Crops

The first domesticated plants developed from their native wild relatives. Wild plants have evolved many traits that enable them to spread their seeds without the help of humans: stalks may shatter, barbed appendages may attach ripe seeds to the fur of passing animals, birds may eat berries and then excrete thick-walled indigestible seeds miles away. For plants under cultivation, seeds are selected and dispersed by people. Human seed selection may (intentionally or not) favor certain traits, like reduced toxicity or increased seed size, and plants may no longer need their wild seed dispersal mechanisms.

The first plants cultivated in the ancient Near East were annuals, which die after producing seeds for the next generation. Because annual plants have a short reproductive cycle, they may evolve quickly into genetic domesticates. The first domesticated crops were carbohydrate-rich cereals, protein-rich pulses, and flax.

One of the first changes leading to domestication resulted from cultivation: a size increase of the individual cereal grains. Seeds that are sown, protected from predation and weather, are buried deeper than wild seeds that germinate on or near the ground surface. As a result, cultivated plants need more energy to break through the soil. From the cultivated plant's point of view, then, a larger seed is advantageous. With ongoing cultivation, loss of the wild seed dispersal mechanism makes cultivated cereals dependent on humans: when ripe, domesticated grains are more likely to stay attached to the stalk rather than breaking from the stalk on their own in the manner of wild grains.

The life cycle of the domesticated counterparts of the wild wheats and barley mimics nature. Their seeds are planted in the fall, sprout with the coming of the winter rains, and

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Fig. 2.7 ***Overleaf***
Aerial photograph taken near Rayy in the 1930s by Eric Schmidt showing the close relationship between the Iranian Plateau and the mountains in the distance. Courtesy of the Oriental Institute of the University of Chicago.

Fig. 2.8 ***Left***
Close up view of sparse scrub and pebbly surface in the Lut Desert of Iran. © Ninara (flickr)/Kaisu Raasakka.

ripen in the spring. The first domesticated wheats, einkorn and emmer, had wild ancestors that grew well in relatively moist areas of the Eastern Mediterranean (Israel, Jordan, Lebanon, Palestine, and western Turkey) and the core of the Middle East (modern-day Turkey, Syria, Iraq, and Iran). By the time pottery came into use, other wheats, like durum (macaroni wheat) and bread wheat had already evolved and become more popular because they were easier to process and cook.

The pulses are large-seeded members of the pea family. First domesticated in the Middle East, lentil, chickpea, and pea remain popular today. Bitter vetch is now a minor crop grown primarily as fodder. For the first farmers, who did not yet have dung-producing domesticated animals, cultivation of the pulses not only improved the protein content of the diet, but also helped maintain soil fertility through the action of nitrogen-fixing bacteria living on the roots of the plants. Domestication conferred another advantage: wild pulse seeds need more protection from insects and unfavorable conditions for germination, and so have more bitter alkaloids and thicker seed coats than their domesticated relatives. The bitter taste is removed by boiling or roasting. The thinner seed coat and reduced toxicity of domesticated seeds would have improved the flavor with less cooking time. Pulses, whether from wild or domestic plants, are first found on sites without cooking pots, having been accidentally preserved by charring in roasting pits.

Another early Near Eastern crop plant was flax, whose stem fibers are used to make linen cloth. Flax needs a lot of water to grow and is labor intensive to process.

Fig. 2.9 ***Right***
Qashqa'i nomads leaving highland summer pastures in the Zagros Mountains. Oak woodland covers the slopes.

The First Domesticated Animals

The process of animal domestication began when people started to confine young animals and animals who did not flee when they approached. Once caught, these tamer animals would have been penned and used for the first attempts at herding. Once humans controlled flocks of animals that could procreate in captivity and keep their young alive in confinement, they could selectively breed animals for desirable physical and behavioral qualities, such as tameness, meat and milk production, and coat quality. The process of sheep, goat, pig, and cattle domestication happened at roughly the same time as ancient Near Eastern populations were becoming dependent on farming.

We know that most early domesticated animals were slightly smaller than their wild ancestors because the bones of early domesticates (sheep, goats, and pigs) are smaller than the bones of their wild counterparts. Archaeologists think that early farmers may have chosen smaller animals because they were easier to handle and needed less food.

These early domesticates would have been kept to supply meat, fat, and skins to early villagers. They would have expanded the food supply of sedentary populations in several ways. For example, pigs are great recyclers, because they can eat many kinds of organic garbage, like vegetable peelings and scrapings and leftover food. Sheep, goats, and cattle are ruminants whose specialized stomachs can digest plants that are too tough for people to digest or of little nutritive value to humans. Ruminants can also graze in pastures that are too dry or too steep ever to be used to farm crops. After hundreds of generations

of selective breeding in captivity, some sheep and goats became tame enough to milk, and some sheep grew a woolly coat that could be sheared for fiber.

The development of both milking and shearing shows how physically and socially close the people of the ancient Near East had gotten to animals. Their meat was an essential food source, and their production of milk allowed people to harvest valuable nutrients for years before slaughtering individual animals for their meat. Artifacts dating to the 6th millennium BCE, including pots for storing and processing dairy products and spinning and weaving implements, are material evidence of this new intertwining of human and animal lives. The arrangement of houses and villages in this period also shows how household organization changed to ensure that animals were safe each night and had access to enough food and water to sustain them.

As the original domesticated species spread across the Middle East, they were taken to places where their wild ancestors had never lived. People had to figure out how to keep their animals alive by identifying what kinds of grass or other food their herds could eat and what time of year it was available; how enough water could be brought to the animals; and how to make sure the herds could survive the driest summers and coldest winters. Each of the original domesticated animals of the Middle East has special characteristics that people took advantage of as complex systems of farming and herding

Fig. 2.10 ***Above***
Unirrigated barley field in a fertile Zagros mountain valley.

developed. Goats give the most milk and do the best in extremely dry regions; sheep give richer meat, more fiber, and can live in colder areas; and cattle give more milk and can pull a plow or cart, but can be very expensive to feed and water. Dung from cattle, sheep, and goats is an important fertilizer and can be burned for fuel. Pigs give no milk for people, but they have lots of babies, mature quickly, and can be raised on food scraps and crop waste around individual households.

Dogs had been guard animals and hunting companions long before the domestication of herd animals, and quickly settled into the life of the early villagers. The earliest dog skeletons known from the Near East have been found curled up next to humans in burials as long as 13,000 years ago. Cats were also domesticated, probably when wild cats came to hunt the mice and rats that had moved into these early villages to feed on stores of grain and other foods. These cats were not pets and may not have been very tame, but they became dependent on the environment that humans were creating in this region.

By virtue of controlling and caring for domesticated animals, people's relationship with the world inevitably changed. Nevertheless, wild animals still held an important place in people's lives and thoughts. Deer, onager, and gazelle were still hunted for food, as were wild sheep, goat, and cattle where these could still be found. Fish, birds, and other small animals were important in some times and places for food and specialized products like feathers and fur. Inventions using other animal products, like glues prepared from hides or perfumes from animal musks, do not leave many archaeological traces, but must have developed long before any records of their use. Predatory or fierce animals like lions, wild cattle, and eagles loomed large in the imaginations of many ancient Near Eastern peoples. Cultural and ideological attention to wild animals has persisted into modern times in artistic motifs, religious images, and stories (Fig. 2.11).

Later Developments in Farming and Animal Husbandry

By 6000 BCE, an agricultural complex based on the cultivation of cereals and pulses, as well as sheep, goat, cattle, and pig husbandry, was established from the lowlands of Mesopotamia to the highlands of Iran and beyond. Many people lived year-round in villages, and pottery was in common use.

Food storage and food preservation technologies developed for both plant and animal products not only tided communities over the winter, but also made it worthwhile to generate a surplus of food. The fermentation processes that produced wine from wild grapes at sites like Hajji Firuz Tepe, Iran, made sour grapes potable; people may have discovered how vinegar pickles vegetables. People also learned how to ferment grain for beer. Over the course of the next two millennia, by about 4000 BCE, the domestication of grape and tree fruits, like date, olive, and fig, added nutritional and culinary variety to

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The Material Foundation of the Ancient Near East

Naomi F. Miller, with contributions from Renata Holod

Stone

The first durable material used to make tools was stone.

Cobbles

Cobbles are unmodified stones that are used to break things (other stones, hard nutshells, etc.). Before the invention of pottery, rocks were also heated to high temperatures in open fires; the hot stones were then placed in pits or baskets to roast food or boil water for the preparation of food best cooked by indirect heat.

Chipped Stone

The modification of stones for tools by striking flakes off one stone using another—a practice called knapping—can be traced back to human ancestors who lived at least 2.5 million years ago. Because stone preserves well archaeologically, the increasingly complex technological developments in tool industries are well documented. Sometimes hafted, sometimes not, chipped stone tools have been used to scrape, cut, pierce, and drill.

Most stone tools are made of flint, which is widely available in the Middle East. Sometimes flintknappers used fire to make it easier to control the chipping process. Obsidian (Fig. 2S3.1), a volcanic glass produced when volcanoes erupt, was prized in the ancient Near East for tools and objects. Its geographical distribution is restricted to active, dormant, or dead volcanoes. Each eruption produced obsidian with a unique chemical signature; this signature can be used to track a particular obsidian piece's point of origin and the ancient trade networks through which it passed. Most obsidian found on archaeological sites in the Middle East came from present-day Turkey. Flint was, until relatively recently, used in cigarette lighters, and obsidian blades are so sharp that they have been used in surgery in modern times.

Ground Stone

Some stones, like basalt, are shaped by grinding to create the working surface. Ground stone mortars (grinding slabs) and hand stones or pestles are sometimes found in association with mineral pigments like red ocher. The people of the ancient Near East made bowls, beads, and other objects from fine-grained stone before they began to cultivate plants. By the time they needed grinders to process wild cereal grains, they had only to adapt their existing technology to make them.

Fig. 2S3.1 ***Right***
Obsidian core (33-3-163) from which long, thin blades have been removed. It was recovered from Level X (ca. 3800 BCE) at Tepe Gawra (Iraq).

Fig. 2S3.2 ***Right***
Unbaked brick is made from a mixture of mud and straw that is placed in a wooden mold and left to dry in the sun. Brick shapes and dimensions are sometimes characteristic of particular cultural periods.

Clay

Clay is one of the most widely available and versatile raw materials. In the ancient Near East, it was used to make small objects including figurines and containers; tools such as spindle whorls; tablets; and buildings. People valued its plasticity, and long before they made pottery to store, cook, and serve food, they understood the principle that fire hardens clay and makes it impermeable to water. Archaeologists value clay because of its extraordinary durability: whether sun-baked or fired, clay artifacts can survive thousands of years of burial. Entire clay objects may break, but their fragments are virtually indestructible. It is thanks to clay, which was used to make buildings, pots, and tablets for writing cuneiform, as well as a wide variety of other things, that we know so much about the economy, society, and literature of the ancient Near East.

Building Material

Clay became the building block for houses and temples in the ancient Near East, especially in wood- and stone-poor regions; most structures in such regions were built with unbaked mudbrick (Fig. 2S3.2). Important buildings, like temples and palaces, were made of more durable baked bricks, some of which were impressed with the name of the ruler who sponsored the work.

Pottery

Potsherds, the remains of fired clay containers of all sorts, are the most common artifacts found on sites in the Middle East. In addition to their practical use in cooking, serving, and storing food, clay ceramics could express the status and cultural affiliation of their users. The archaeological study of potsherds can reveal the function of specific pottery forms or vessels, aspects of social life, date of origin, and

the geographical affiliation of the potters. For example, a narrow-necked bottle would probably have contained liquids, while an open bowl is more likely to have been used for serving food. The fineness of a vessel's manufacture and quality of its design suggest the status of those who used the material. Since shapes and styles of decoration change over time and across space, pottery is very important for dating and correlating sites; the presence of similar or identical pottery shapes and decoration at different sites may provide evidence of trade or other connections among them (Fig. 2S3.3). Technical analyses of the clays used for pottery vessels may reveal the source of the clays, or point to subtle differences in the production techniques used by different potters.

Cuneiform Tablets

From the late 4th millennium BCE, unbaked clay was also formed into tablets of various shapes and sizes (Fig. 2S3.4); these tablets were initially inscribed with pictographic signs, and later with cuneiform writing, to form the first written records. Over the next three thousand years, clay tablets would be used to record economic transactions, political treaties, literary narratives, personal letters, scientific observations, prayers to the gods, and a striking variety of other sorts of information.

Fuel and Pyrotechnology

Well before the Middle East became one of the world's major suppliers of oil, people collected the hydrocarbon bitumen that seeped to the surface in parts of Mesopotamia as an adhesive and to waterproof containers. Other materials such as wood and animal dung were exploited to fuel fires for cooking and heating. The people of the ancient Near East were also familiar with fire's ability to transform inorganic material. The development of fuel-intensive technologies including the heat-treatment of flint, the hardening and waterproofing of clay objects, metallurgy (Fig. 2S3.5), and glass production helped create the world we live in today.

Fig. 2S3.3 ***Opposite***
High-quality ceramics like this plate (NEP74) from Kashan (Iran) were produced in late 16th through mid-17th century CE workshops in Iran and Iraq. New glazing techniques created lusterware, which was highly valued and often exported.

Fig. 2S3.4 ***Right***
This tablet (B3293) from Nippur (Iraq) is an ancient 'spreadsheet' from ca. 1400 BCE used by a trained scribe to track goods. Each cell contains quantities, but the header row is missing so the function is not clear.

Wood and Charcoal

Wood was the fuel of choice for millennia in forested and lightly wooded areas. In drier regions, small shrubs and animal dung were burned.

The fuel demands of household heating, cooking, and pottery production may have led to some localized loss of woodland resources, but metallurgy added even more stress on the woody vegetation. Bronze, which came into common use in the 3rd millennium BCE, can be produced with wood fuel. Iron smelting, which is even more fuel-intensive, requires charcoal. Charcoal is made when wood is burned in the absence of oxygen. It has a lower moisture content, and its combustible constituents are more concentrated. By weight, therefore, charcoal has a higher fuel value than wood, but producing it uses up a lot of the energy value of the original wood. Deforestation, exacerbated by the expansion of iron metallurgy, became widespread in the 1st millennium BCE.

Fig. 2S3.5 ***Above***
Art adorned everyday objects such as furniture. This lion's head sculpture (B17064) was buried along with its owner, Queen Puabi, in the Royal Tombs of Ur (Iraq) ca. 2450 BCE.

Animal Dung

Pre-agricultural peoples of the steppe burned the dung of wild animals, like gazelles, for fuel. Fortunately, the dung of herbivores does not smell bad when burned. In later periods, animal dung (as well as small shrubs) continued to be used for fuel (Fig. 2S3.6). As populations grew and the number of people living in permanent settlements increased, the trees and shrubs in the immediate vicinity of habitations became depleted. Animal dung took up the slack; after animals were domesticated, dung became a handy fuel supplement even in areas of open woodland.

Fiber and Fiber Products

Plant and animal fibers were used to make many items, including cordage, nets, baskets, mats, and cloth. While these organic materials are perishable, traces of fiber artifacts may survive under dry conditions as impressions in soil or other materials and, in the case of reed matting, as phytoliths, visible traces of the silica deposited in the cell walls of reed stems. We can also infer the use of fiber from the tools used for spinning and weaving.

Linen

Linen, made from flax, was the first woven cloth. The earliest surviving example of linen cloth was found in a dry cave site in Israel dating to about 6500 BCE, but flax seeds are relatively common at other sites dating to this period. After sheep wool became available, flax persisted in use as a luxury fiber, especially in Mesopotamia.

Animal Fiber

Goat hair was probably used for making tents and ropes. The first domesticated sheep had hairy coats. Wool became the most common textile in this region after domesticated sheep were bred for woolly fiber.

Silk

Silk production in the ancient Near East and Eastern Mediterranean dates from the 6th century CE, when

Fig. 2S3.6 ***Right***
Archaeological mounds are created as mudbrick walls melt and trash piles up in and around abandoned structures. In 1978, people living at the edge of the village of Malyan, Iran, collected their courtyard sweepings, mostly animal dung, to be trucked to the fields as fertilizer. The photograph shows the accumulation of animal dung and ashes over melted mudbrick walls at the edge of the village.

silkworms probably arrived in the region. As silkworms subsist almost entirely on leaves of the mulberry tree, which is native to China, silk production required the import and cultivation of both the silkworm and of the mulberry tree. Depictions of figured silks are shown in late Sasanian reliefs at Taq-i Bustan and in 6th to 8th century CE Soghdian (Central Asian) painting programs at Penjikent and similar sites. Excavations at Rayy, Iran, have found silk cloth remnants datable in between the 10th and 12th centuries CE. Comparable silk remnants have also been preserved in medieval European church treasuries.

Cotton

Cotton does not appear to have been grown in the Middle East until the early Islamic Period. It is mentioned, along with silk, as part of textile production at Rayy and other major centers of the 10th century CE in Persian and Arabic geographical texts in which many different kinds of cloth production are listed, some of mixed cotton and silk, or linen and silk.

Textiles

Textiles have long played an important role in the economy and worldview of the people of the Middle East, as evinced by the images of weavers that appear in pictorial art and the references to textiles in numerous economic texts and literary narratives inscribed on clay tablets and later written on parchment or paper. Woven textiles were a high value, lightweight product that could be traded for other valuable products like metal and fine-grained stone over long distances.

the menu. In Mesopotamia, the date palm became a staple crop for rich and poor alike. After about 6000 BCE, land where rain-fed farming had been marginal or impossible could now be rendered productive through irrigation. Over the following millennia, with the development of trade and communication networks across Eurasia, crops that had been domesticated outside the Near East were introduced. Many of them, like millet, rice, and sesame, could be grown only in the summer under irrigation. By the 7th century CE, a variety of other warm-season crops, such as cotton, sorghum, lime, and sugar cane, were added to the repertoire. It was not until the European Age of Discovery in the 16th century CE that tomato, potato, tobacco, and other crops from the Americas became integrated into Middle Eastern cuisines and lifestyles.

Changes in animal husbandry proceeded alongside developments in farming over the course of millennia. People had long used animal dung as a fuel source to supplement wood, but new animal breeds yielded milk, which could be turned into a variety of storable dairy products with the help of microorganisms like yogurt bacteria and cheese microbes, and wool, which soon dominated textile production. Oxen were harnessed to the plow, which allowed farmers to cultivate more land. Other domesticated animals, such as the donkey, horse, and camel (the one-humped dromedary and the two-humped Bactrian camel) came into the Middle East from elsewhere. The introduction of these animals, able to carry heavy loads across long distances, is associated with increasing long-range trade.

A new mode of life called pastoral nomadism developed, probably in the mid-third and early 2nd millennia BCE, after the time of the first cities. Nomadic groups began to travel with their herds past settled villages, taking advantage of highland pastures in the summer and lowland pastures in the winter. As sedentary people had to limit herd size according to the number of animals they could feed during the dry summer or snowy winter months, their herds were not big enough to consume all the available pasture plants. By fully utilizing seasonally rich pastures, pastoral nomadism could support more animals on the same land.

Smaller animals, like the chicken, became increasingly popular in the 1st millennium BCE. Arriving by the 6th century CE, the silkworm and the mulberry trees on which it feeds are a relatively late, but important, addition to the agricultural systems of the Middle East.

Fig. 2.11 ***Opposite***
Stag and gazelle pendants (clockwise from top left: B16684.5, B16684.6, B16684.2, and B16684.1) from the diadems of Queen Puabi that were deposited in her lavish burial in the Royal Cemetery of Ur (ca. 2450 BCE). Animals are frequently portrayed in the art of the ancient Near East. Some are clearly food animals, but others may depict specific characters or refer to events in stories.

For Further Reading

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